

A photograph of a tunnel interior. The road is asphalt and curves to the right. It features white road markings: a solid white line on the left, a dashed white line in the center, and several white circles on the right side. The tunnel walls are made of concrete and have several red and white chevron signs pointing right. A car is visible in the distance on the right side of the road.

The Making of Motorcycle Road-Markings

Martin Winkelbauer | 7.10.2026 | KFV Webinar

About KFV (Austrian Road Safety Board)

- Non-profit
 - Non-governmental
 - Road safety
-
- KFV (Kuratorium für Verkehrssicherheit/Austrian Road Safety Board) is the major road safety institution in Austria
 - KFV is politically independent
 - Funded in 1959, KFV has been the Austrian competence centre for road accident prevention for more than 60 years
 - A strong team of transport and civil engineers, traffic psychologists, sociologists, educationists, statisticians and legal experts work cross-disciplinarily and provide high-quality services in all areas of road safety and mobility

Why road markings?

Riders' 3 kinds of being too fast

a) Too fast for the law
(this is not a fake)



b) Too fast for physics challenging Newton und Coulomb ...



c) Too fast for the litte devil in your reptile brain



Sometimes the road too narrow?

Still
sitting
on the
bike!



Crash causation

Most riders cut curves

With oncoming bus (min. once an hour there)

- 5% safe line
- 79% must swerve
- 16% would fit between the A-pillars of the bus
- And they don't know, don't even believe

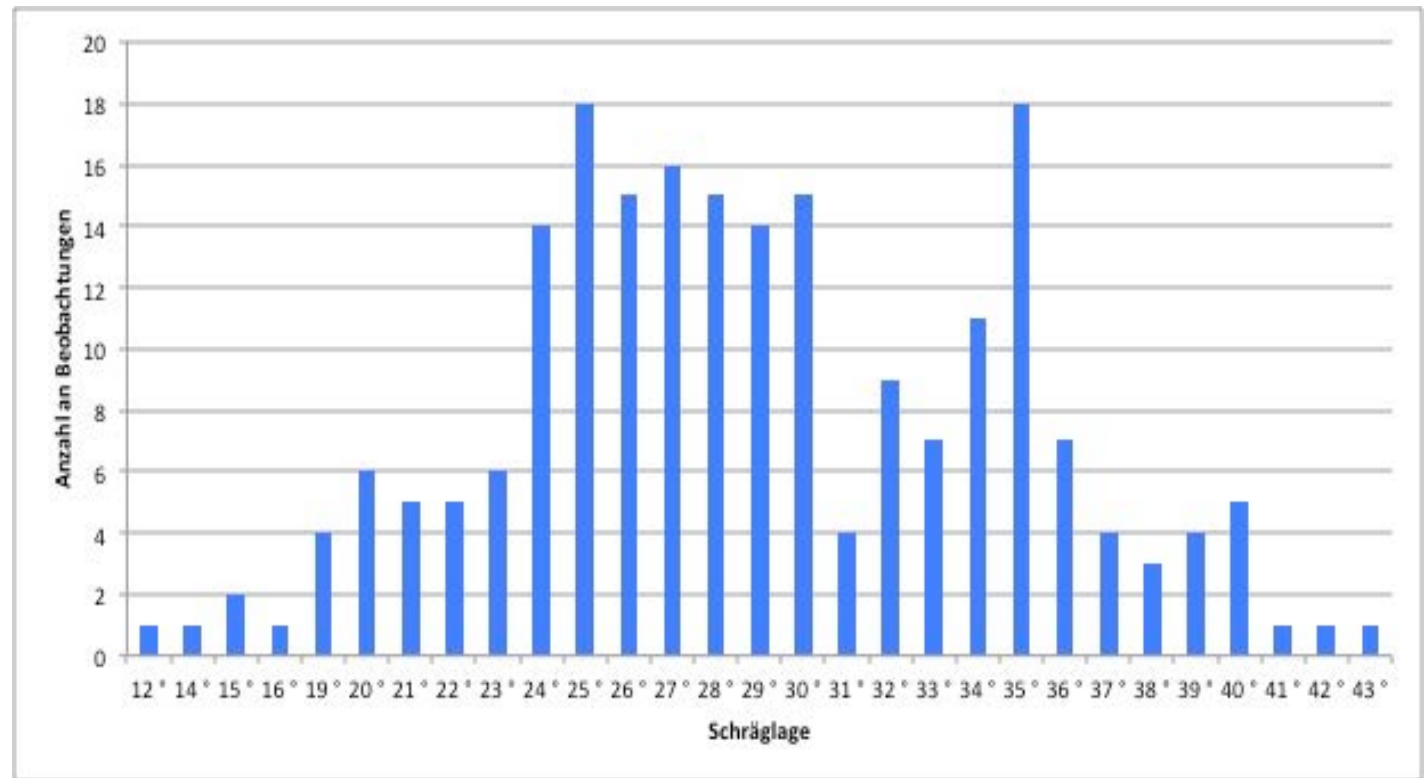
Why a solution?

Riders avoid anything potentially slippery
(as taught 1000x in driving school)

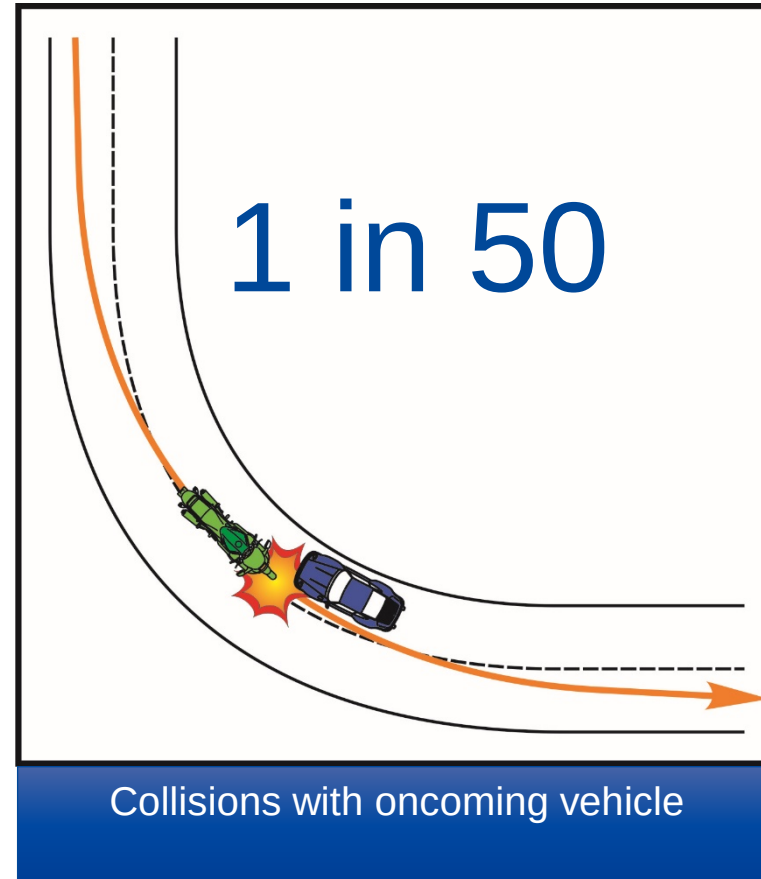
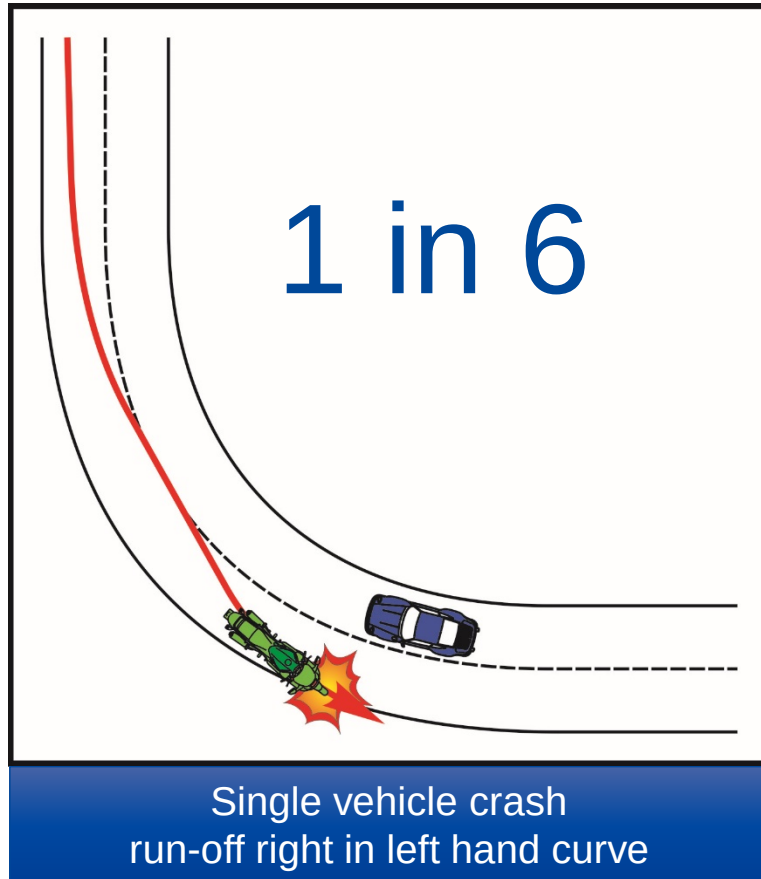


Roll angle anxiety, personal limit for roll angle

- Riders feel well ...
... next to their limit
- Riders never go beyond their limit
- Riders, hence, permanently move at the edge of catastrophe
- Typical roll angles (295 cases)



Typical crash types



... half of them still on the bike

Just 2 types of curves Type A



Type B



Warnings neglected

These are just for the stupid car drivers ...



Different layouts

W style

- Worked well, but messed up with closed area

Lots of dots

- Too small to perceive

Elliptic

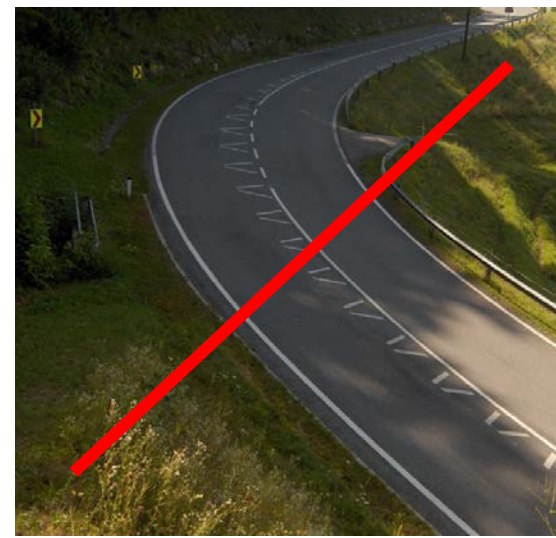
- Unique, no other purpose
- Accepted by riders

Half elliptic

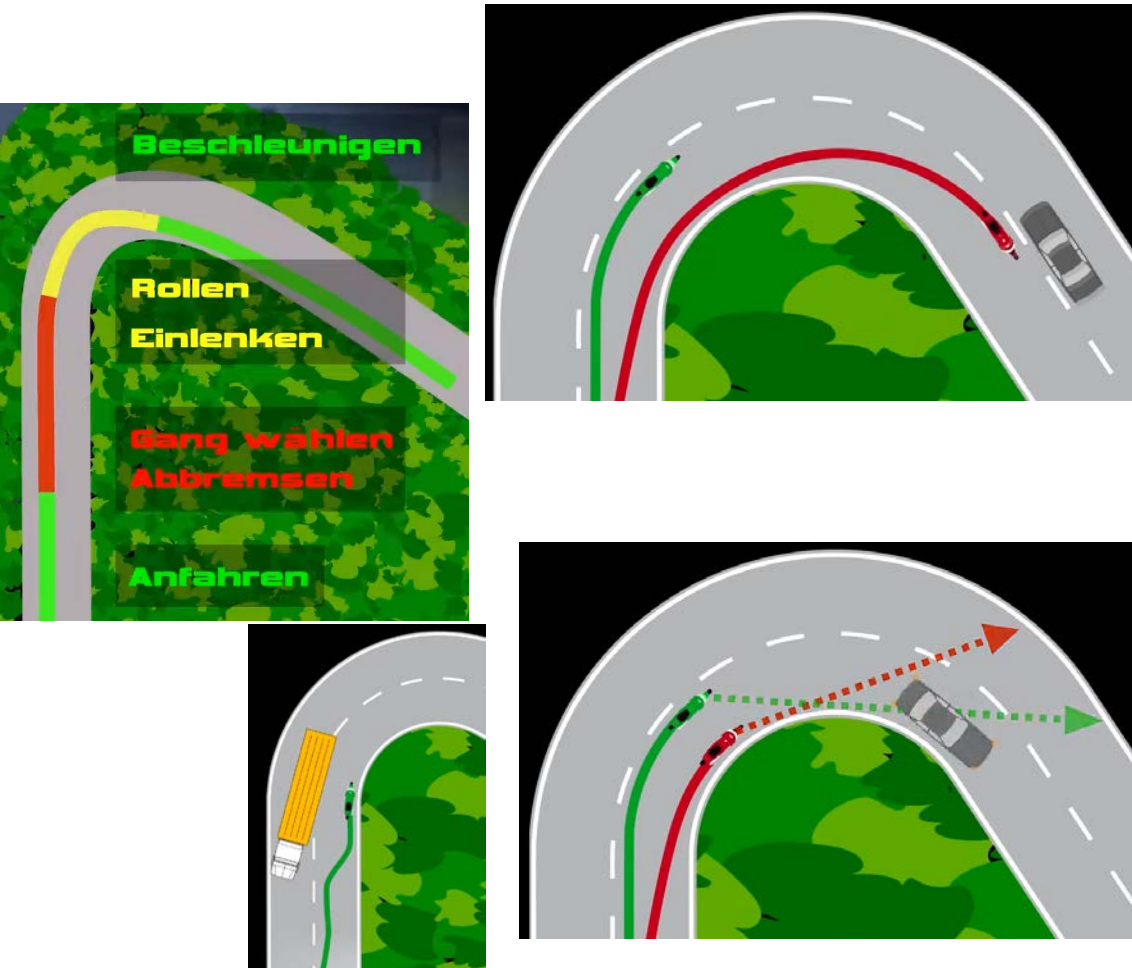
- Saves material
- Right hand curves
- Little space, early warning

bars („psychological brake“)

- More known by people



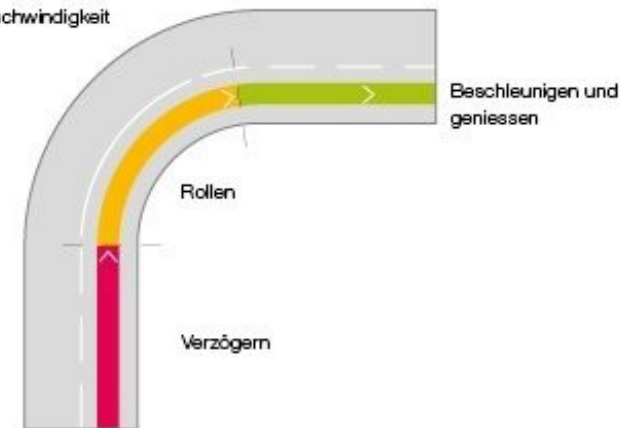
You should know, how to ride a curve with a motorcycle and the theory behind



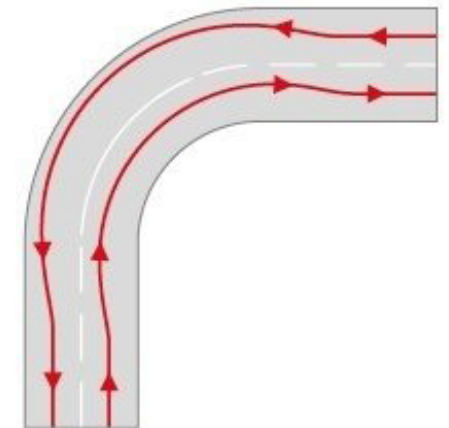
So fahren Sie Kurven sicher.
Und genussvoll.

Geschwindigkeit reduzieren,
Kurve anfahren, beschleunigen

Kurvengeschwindigkeit



Achten Sie auch auf
die richtige Linienwahl:

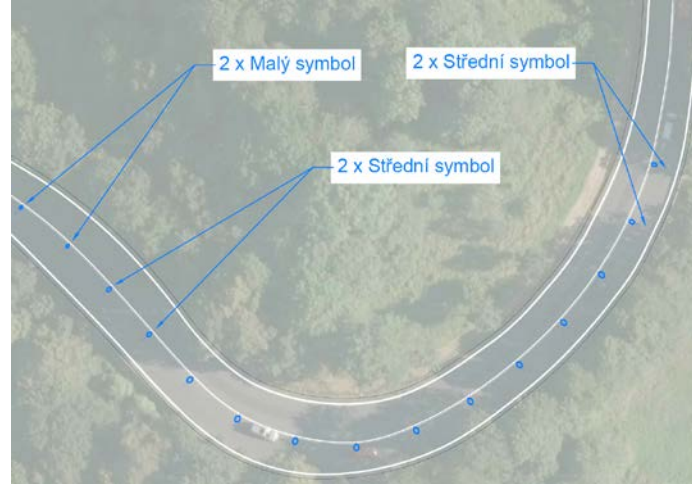


Grafiken und Fotos aus
Roman Angermann & Klaus Schwabe
Different approaches with regard to safe cornering lines
and how to adopt them – background information and
possible improvements
12th ifz Motorcycle Conference, 2018, Cologne

How plan?

Overview of options

- Design from scratch
- Simple drawings
- Use videos to describe (The Luxembourg method)
- Test with chalk
- Probationary laying markings (don't run over, you'll fall)
- Draw with chalk, take pictures, lay later



Which curves?

- Please, only dangerous ones
- No habituation so far ...
- ... but possible upon inflationary use



Potential errors:

Start late

Never surprise riders! If the markings start shortly after a curve, they might get caught on the wrong side or be frightened

Send riders out of the curve

On min. the last second before the curve starts, markings must be parallel to centre and edge line

No center line

Take care, riders don't get to the other side
(can be overcome)

No changes afterwards

E.g. adding edge lines changes the optical impression



Mounting Process:

- Outline with chalk
- Check the optical impression
- Test with motorcycle
- Improve – check – improve
- Put markings in place, check again
- Indicate final position with chalk
- Apply primer (be generous!)
- Protect wet primer with cones against passing vehicles
- Let dry (1-20 minutes). Finger test. Milky surface.
- Peel protective sheet (partly or complete), lay markings
- Press with drum ... Ready!
- Cars can immediately run over



Which material?

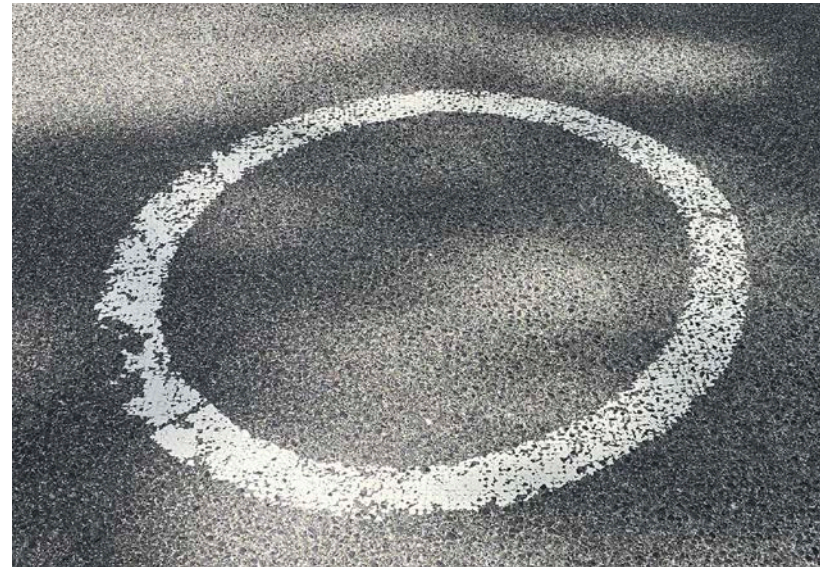
Stamark 380 by 3M

pros:

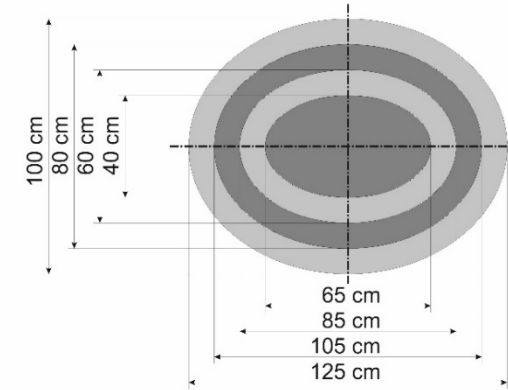
- Lifetime 10 years and more
- Easy preparing the layout
- Overridable immediately
- Expensive

Cons:

- Not for large numbers of trucks
- Expensive



Material tailoring



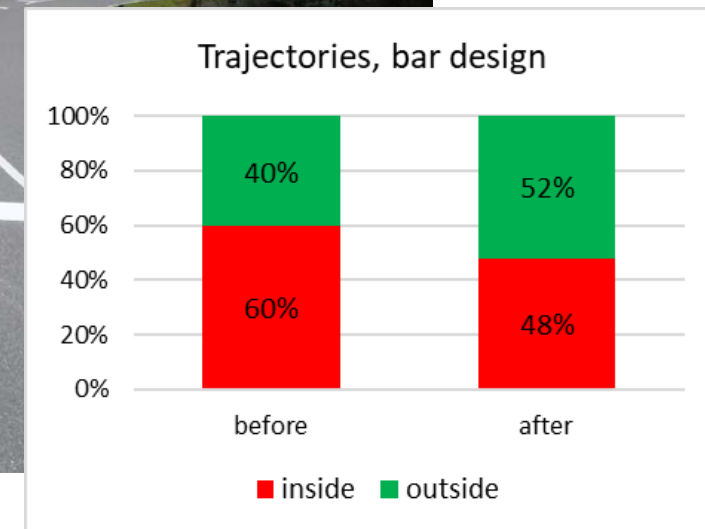
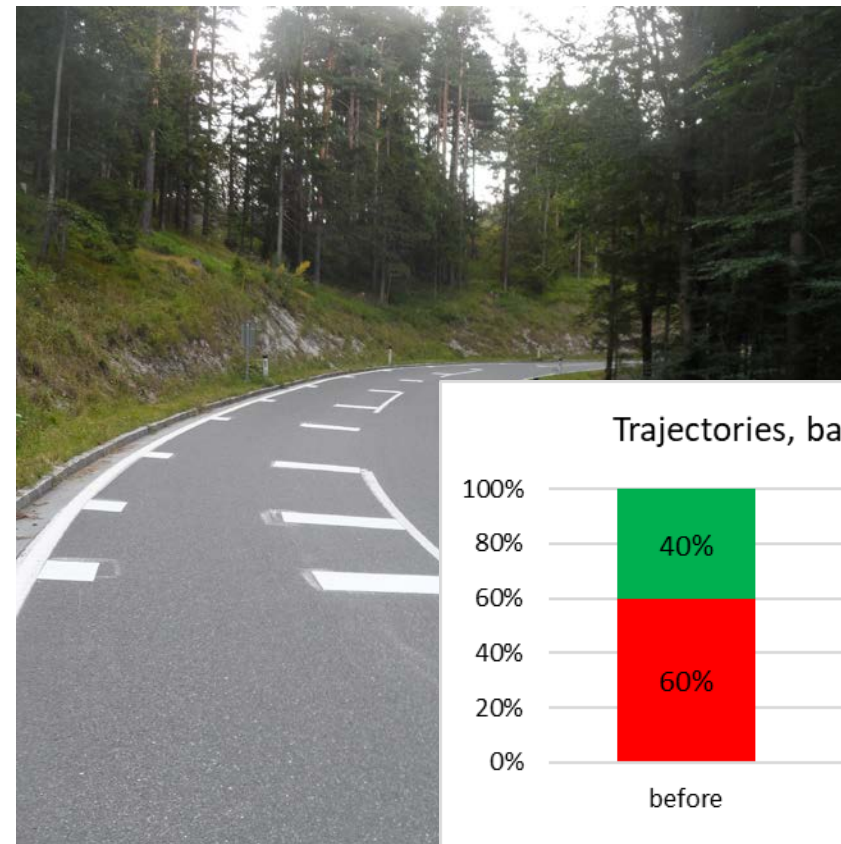
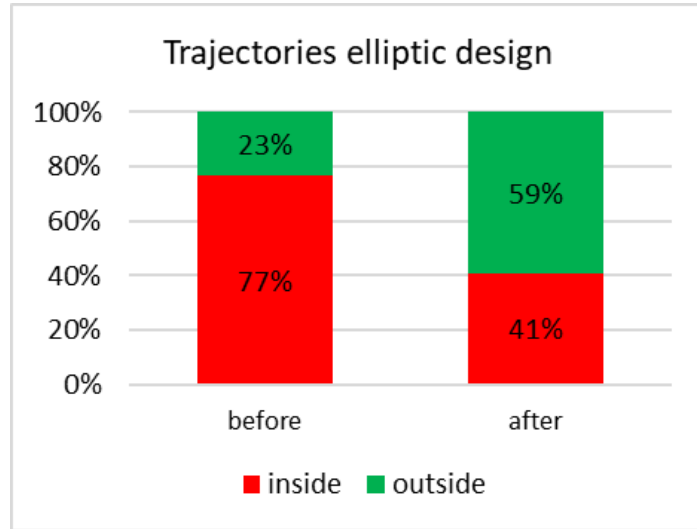
Stamark 380 – 50 cm width – 25 m length

1. 1 roll = 87 half-ellipses (if you cut then back to back)
2. CNC-cutter very accurate but expensive
3. Own model good enough (see photo)
4. Cut bar design on the spot
5. Use simple carpet knife, replace the blade after 12-20 ellipses. Use 5 clamps!



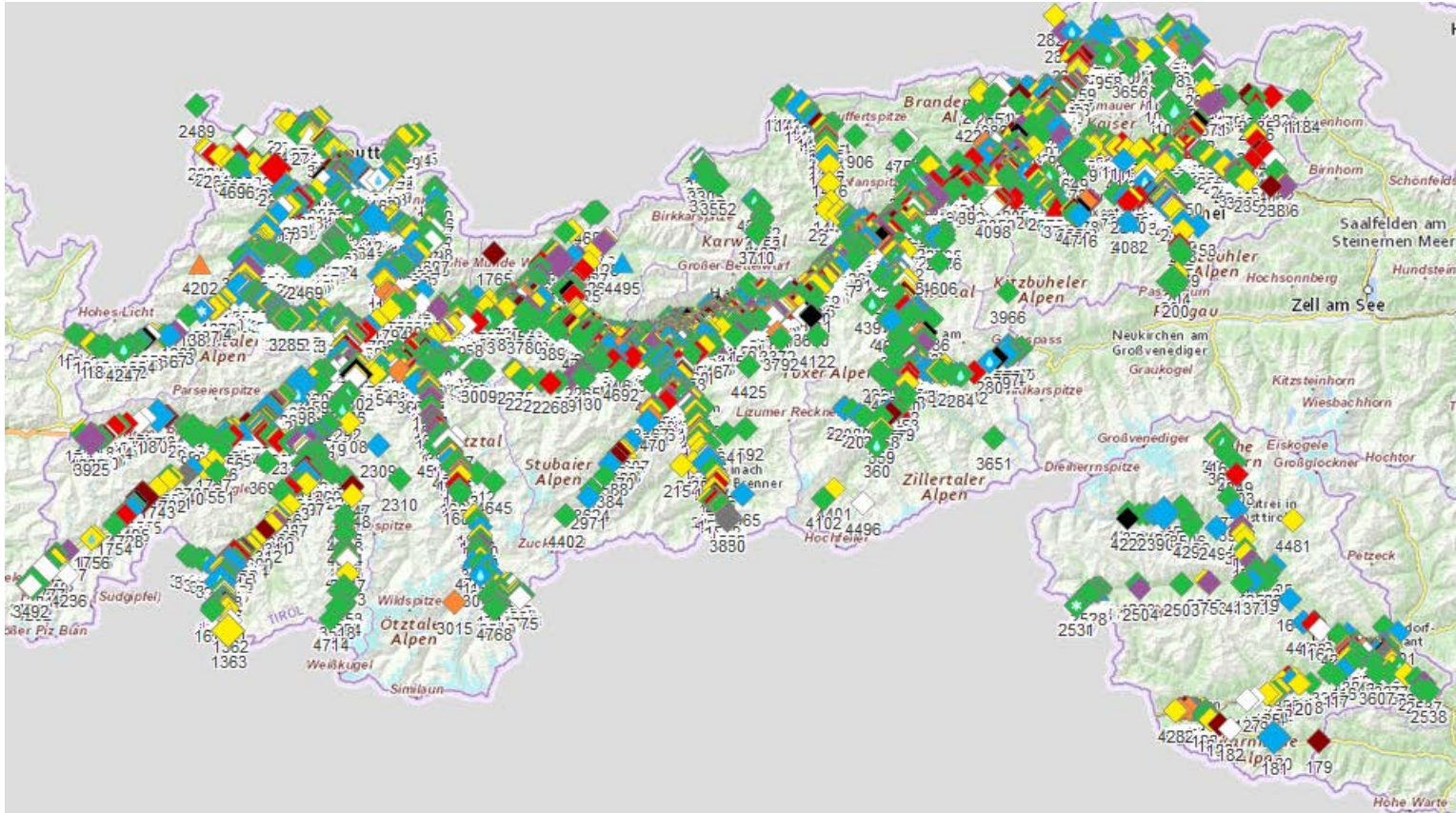
History and impact...

1st evaluation, 9 curves in Austria, 2016: Significantly better trajectories



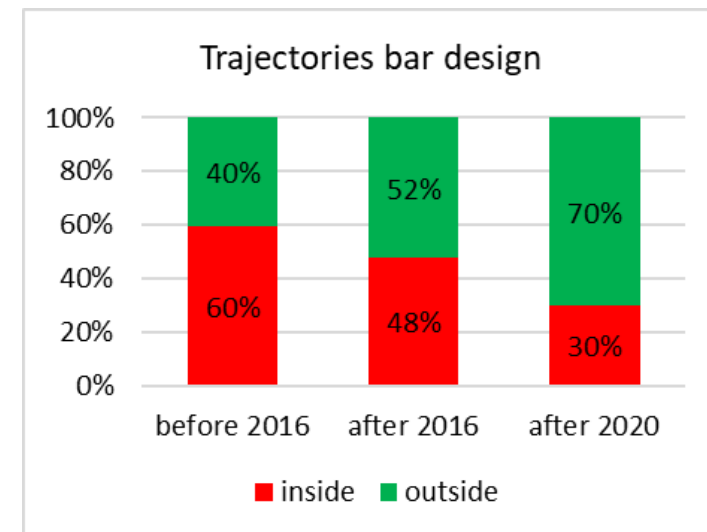
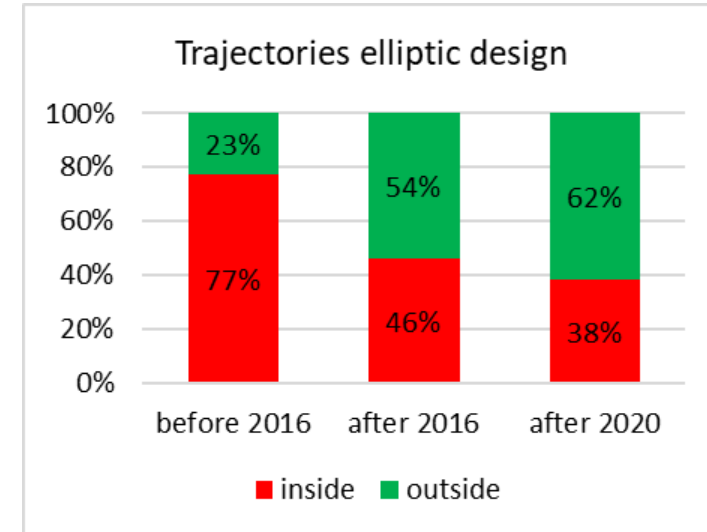
Tirol, 2019

19 dangerous curves identified with our software



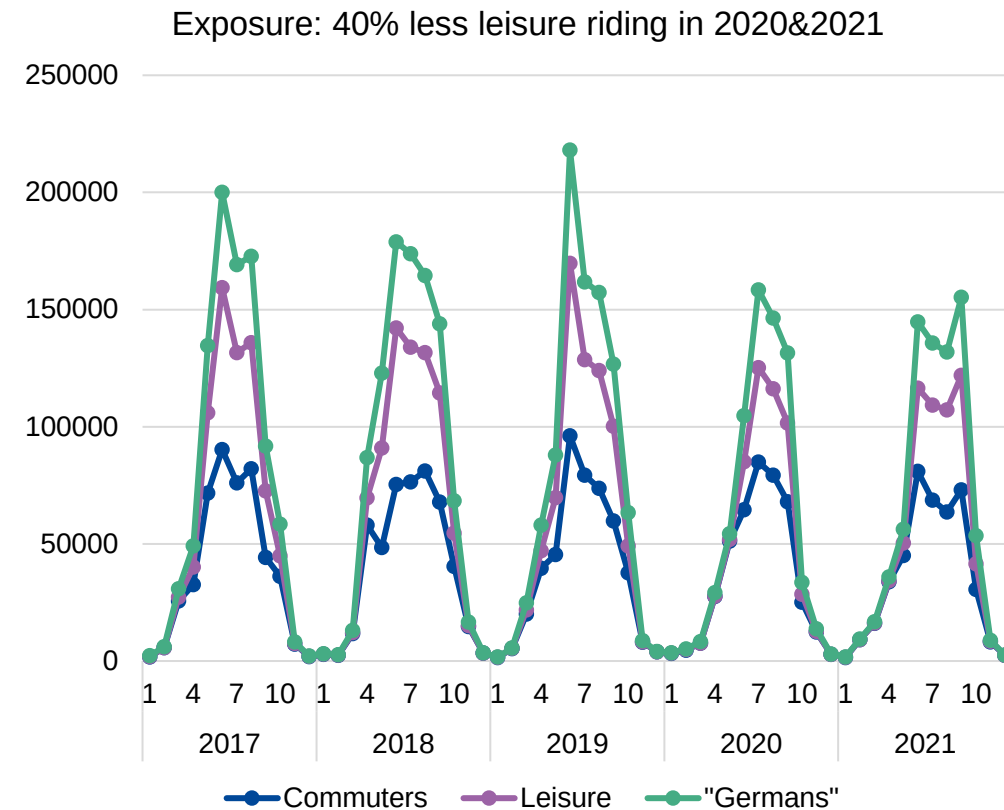
2nd evaluation 3 years later (2020)

- 7 cuves
- Ellipses get better
- Bars catch up
- 16 to 7 injuries reduction



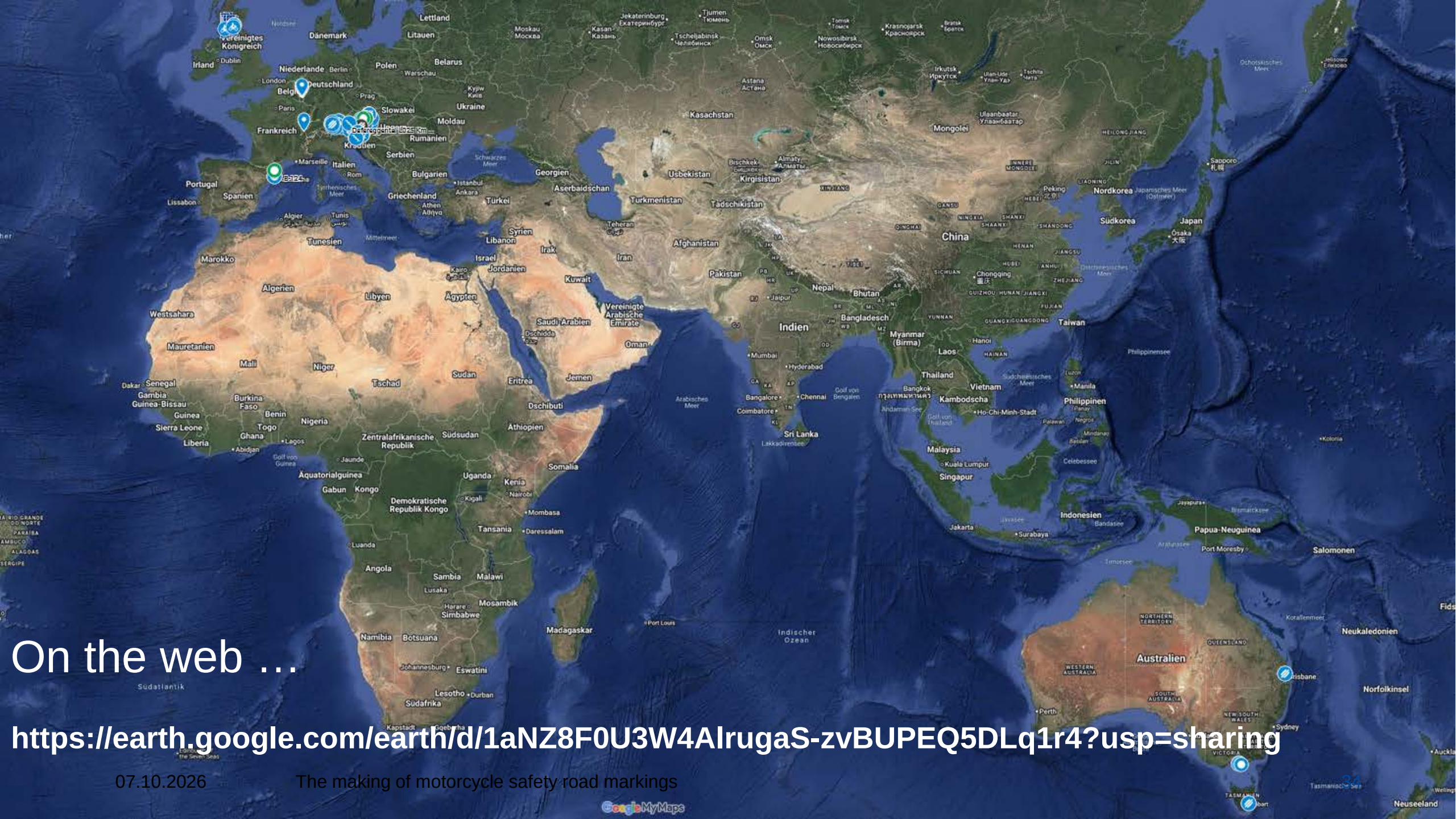
Tirol 2022 Evaluation

- **19 curves**
- **Before (2012-6/2019)**
 - 6,3 slight injuries p.a.
 - 6,4 severe injuries p.a.
 - 0,57 fatal injuries p.a.
- **After (7/2019-12/2021)**
 - 2 slight injuries
 - 2 severe injuries
 - Control for exposure (corona)
- **80% less injuries**



European Road Safety Award, 2024





On the web ...

<https://earth.google.com/earth/d/1aNZ8F0U3W4AlrugaS-zvBUPEQ5DLq1r4?usp=sharing>

07.10.2026

The making of motorcycle safety road markings



Thanks for listening!

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